IN THE CLAIMS:

Please reconsider the following claims:

1. (Original) A method of determining a flow rate of fluid flowing within a pipe, comprising:

providing a pipe, at least a portion of the pipe having a larger inner diameter than a nominal inner diameter of the pipe, wherein the pipe diverges from the nominal inner diameter of the pipe to the larger inner diameter of the pipe in the direction of fluid flow;

measuring a differential pressure between at least two locations along the pipe, at least one location positioned in the portion having an inner diameter greater than the nominal inner diameter of the pipe; and

determining a flow rate for the fluid based on the measured differential pressure.

2. (Original) The method of claim 1, wherein determining a flow rate comprises calculating a flow rate from the measured differential pressure and a density of the fluid.

3. (Original) The method of claim 2, wherein the density of the fluid is measured using a method including either sampling the fluid or measuring the density via a density meter coupled to the pipe.

4. (Original) The method of claim 1, wherein the at least two locations comprise the portion of the pipe having the larger inner diameter and the portion of the pipe having the nominal inner diameter of the pipe.

5. (Original) The method of claim 1, wherein the differential pressure is measured using a differential pressure sensor disposed on the pipe, the differential pressure sensor having a differential pressure resolution of 0.001 psid.

6. (Original) The method of claim 1, wherein the differential pressure is measured using an optical sensor coupled to the pipe.

7. (Original) The method of claim 1, wherein the inner diameter of the portion of the pipe having the larger inner diameter is approximately 0.25 inches greater than the inner diameter of the portion of the pipe having the nominal inner diameter of the pipe.

8. (Original) The method of claim 1, wherein the pipe diverges from the nominal inner diameter of the pipe to the larger inner diameter of the pipe and back to the nominal inner diameter of the pipe in the direction of fluid flow.

9. (Original) An apparatus for measuring a flow rate of a fluid flowing in a pipe disposed in a wellbore, comprising:

at least one differential pressure sensor disposed along the pipe across two locations for sensing differential pressure along the pipe, wherein at least one of the locations is at an enlarged inner diameter portion of the pipe, and wherein the pipe diverges from a nominal inner diameter of the pipe to the enlarged inner diameter of the pipe in the direction of fluid flow;

processing equipment for converting the differential pressure to flow rate data; and

one or more transmission lines for communicating differential pressure information from the at least one differential pressure sensor to the processing equipment.

10. (Original) The apparatus of claim 9, wherein the at least one differential pressure sensor comprises a minimum measurable pressure differential of 0.001 psid.

11. (Original) The apparatus of claim 9, wherein the at least one differential pressure sensor comprises one or more optical sensors.

12. (Original) The apparatus of claim 11, wherein the one or more transmission lines comprises one or more optical transmission lines.

13. (Original) The apparatus of claim 12, wherein the processing equipment comprises optical signal processing equipment.

14. (Original) The apparatus of claim 9, wherein the processing equipment comprises logic configured to calculate flow rate based on the differential pressure and a density of the fluid.

15. (Original) The apparatus of claim 14, wherein the logic is further configured to calculate the density of the fluid at or near the two locations.

16. (Original) The apparatus of claim 9, wherein the minimum measurable flow rate by the at least one differential pressure sensor is approximately 0.08 feet per second.

17. (Original) A method for determining the flow rate of fluid through downhole tubing, comprising:

providing an enlarged inner diameter portion of the downhole tubing disposed upstream of a remaining portion of the tubing;

measuring a pressure differential between the enlarged inner diameter portion of the tubing and the remaining portion of the tubing; and

determining the flow rate of the fluid using the pressure differential.

18. (Original) The method of claim 17, wherein the pressure differential is measured by a differential pressure sensor coupled to the tubing.

19. (Original) The method of claim 17, wherein the pressure differential is measured by one or more fiber optic sensors coupled to the tubing.

20. (Original) The method of claim 19, further comprising measuring a density of the fluid using the one or more fiber optic sensors.

21. (Original) The method of claim 17, wherein the pressure differential is measured by determining a difference between the pressure measured by at least two absolute pressure sensors, a first absolute pressure sensor located at or near the enlarged inner diameter portion and a second absolute pressure sensor located at or near the remaining portion.

22. (Original) An apparatus for measuring flow rate of fluid within a wellbore, comprising:

a tubing string having a diverging inner diameter portion positioned upstream of a section of the tubing string, wherein the tubing string is disposed within the wellbore; and

a differential pressure sensor disposed on the tubing string and the diverging inner diameter portion for measuring a difference between fluid pressure in the tubing string and fluid pressure in the diverging inner diameter portion.

23. (Original) The apparatus of claim 22, further comprising a processing system connected to the differential pressure sensor for converting measurements of the differential pressure sensor to flow rate data using a density of the fluids.

24. (Original) The apparatus of claim 23, wherein the differential pressure sensor comprises one or more fiber optic sensors.

25. (Original) The apparatus of claim 24, wherein the one or more fiber optic sensors are connected to the processing system with one or more optical waveguides.

26. (Original) The apparatus of claim 22, wherein the differential pressure sensor comprises at least two absolute pressure sensors, at least one of the at least two absolute pressure sensors disposed at or near the diverging inner diameter portion.

27. (Original) The apparatus of claim 26, wherein the at least two absolute pressure sensors are fiber optic sensors.

28. (Original) A flow meter for use in measuring fluid flow within a downhole wellbore, comprising:

first and second portions, each having substantially the same inner diameter; and

a middle portion, an inner diameter of the middle portion diverging outward toward the wellbore from the first and second portions,

wherein a difference in fluid pressure is measurable between the middle portion and the first or second portion.

29. (Original) The flow meter of claim 28, wherein the fluid pressure is measurable with a differential pressure sensor having a minimum differential pressure resolution of approximately 0.001 psid.

30. (Original) The flow meter of claim 28, wherein the fluid pressure is measurable with one or more fiber optic sensors disposed about the flow meter to measure the difference in fluid pressure between the middle portion and the first or second portion.

31. (Original) The flow meter of claim 28, wherein the inner diameter of the middle portion is approximately 0.25 inches greater than the inner diameter of the first or second portion.